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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/935,804	08/23/2001	Niels Christiansen	P/772-299	9590
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DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP				
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WASHINGTON, DC 20037-1526				
EXAMINER				
FORTUNA, ANA M				
ART UNIT		PAPER NUMBER		
1723				

DATE MAILED: 10/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/935,804

Applicant(s)

CHRISTIANSEN, NIELS

Examiner

Ana M Fortuna

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

1. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 6 is unclear as to the Zeta potential of the membrane, as a property of the membrane. Defining the membrane property as depending on an intended use of the membrane in the system is confusing, since the allowability of the system is determined based on the system structure, therefore, for examination purpose the system is considered as consisting at least one porous ceramic metal oxide membrane, a pump, and the membrane having a Zeta potential, e.g. charged membrane.

Claim Rejections - 35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Gan et al. (Beer Clarification by Cross-flow Microfiltration). Gan et al discloses the system including a pump and a ceramic membrane, or aluminum oxide membrane (alumina) (Fig. A, page 4, column 1, or entire article). The charge of Zeta potential in alumina (aluminum oxide) seems to be inherent of the membrane material.

2. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by GB 2176715A(hereinafter '715). The apparatus or system as claimed is disclosed in '715 (Fig. 1). The membrane is disclosed as a ceramic membrane, e.g. aluminum oxide (sintered alumina) is

also disclosed in the reference. The Zeta potential is not discussed in the reference; however, seem to be inherent of the membrane material.

Claim Rejections - 35 U.S.C. § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burrel et al (Crossflow Microfiltration of Beer; Laboratory-Scale Studies on the Effect of Pore Size), or Burrel et al in view of Goldsmith et al (5,114,581), and Strohm et al (5,878,957)(hereinafter '557). Burrel et al discloses the process of filtering beer with Ceramem Ceramic membranes, the membrane consists of a thin ceramic layer on an extruded support (abstract, columns 1-2, page 399). As to claims 3-4, the process is a Crossflow filtration process, and removal of yeast and haze forming colloids is also disclosed (page 399, column 1, paragraphs 1-4). The membranes as disclosed by Burrel et al are known in the art as made from ceramic materials including zirconia, Titania, alumina (oxides), etc., both the support and the membrane layer. It would have been obvious to one skilled in the art at the time the invention was made to use a membrane of zirconia, titania, or alumina in the process of the present invention as the Ceramem Membrane for the beer filtration or yeast removal from the suspension. The pH and Zeta potential factors are not disclosed by Burrel et al, however, this property seems to be inherent of the particular ceramic materials claimed, which are not detailed By Burrel et al, but incorporated by reference by referring to Ceramem membranes having the composite ceramic and monolithic

structure disclosed (column 1, last paragraph and column 2, page 399). Regarding claim 6, the apparatus structure including the membrane for Crossflow operation is also disclosed (Fig. 2). Goldsmith et al. ('581) discloses the membrane module made of ceramic support and ceramic layer (Ceramem Corporation membrane) which inherently possesses the Z potential and properties claimed, the membrane and support are made from zirconia, titania, alumina, etc. (Abstract, Figures, column 2, lines 37, and 48-58, column 4, last paragraph, though column 5, lines 1-23); the use of the membrane for liquid filtration and removal of particulate matter of a few particle size from a few micron down to submicron size (column 2, lines 19-22). It would have been obvious to one skilled in the art at the time the invention was made to use the Ceramem membrane disclosed by Goldsmith et al in a process of filtering beer or wine or fermented beverage, as disclosed in Burrell et al., since the membrane possesses the properties required in the process of Burrell, discloses the ceramic materials which inherently possesses the Zeta potential and polarities at a given pH as required in the present invention. As to claim 1, the pH value of fermented beer is known to be about 7. Filtering beer from a fermentation process and the fermentation pH, to remove yeast and colloids it would have been obvious to one skilled in the art at the time the invention was made, based on Burrell et al teaching.

Reference '557 further teaches filtering of beer by cross-flow ceramic microfiltration, using conventional ceramic membranes, and selecting or adjusting at a low pH. e.g. 4.21 and 4.19 (abstract, column 2, lines 37-68, column 3, lines 1-68, and column 4, lines 1-4, column 6, lines 16-47). Therefore, adjusting the pH range of the beer to be filtered and its filtration in microfiltration membranes made of polymeric and ceramic materials commercially available, is suggested, and the membrane performance based on the feed solution chemical composition should have been expected by one skilled in the art at the time the invention was made.

5. Claims 1, 3, 7-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Galaj et al (4,946,592)(hereinafter '591), or Galaj in view of Strom et al (4,946,592)(hereinafter '592).

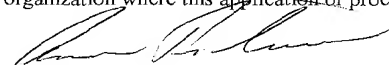
Reference '591 discloses a membrane composite made of ceramic or metal oxides, including the oxides claimed in claim 2, the membrane is a microfiltration membrane and is suggested for the separation or clarification of suspensions, e.g. wine, beer, cider, and alcoholic fermentation liquors (column 1, lines 32-52, column 2, lines 45-68). The membrane can be shaped in tubular form, in which a Crossflow filtration can be performed (column 8, lines 22-28). The pH, and the membrane potential are not disclosed in reference '592. Since the membrane is made from the same materials as the current membrane, and suggested for the same use, e.g. wine, beer, and alcoholic fermentation broth, one skilled in the art at the time the invention was made would have expected the same membrane performance e.g. Zeta potential and pH adjustment for the membrane at a particular pH conditions of the suspension, based on the membrane materials, e.g. for both membranes made of the same composition and pore size, and subjected to the same filtration process, e.g. wine filtration at a given pH, the membrane is expected to show the same performance. Reference '592 teaches filtering beer at a low pH with conventional ceramic or polymeric membrane (abstract, column 4, lines column 2, lines 64-68, column 3, lines 1-23, table (column 6, lines 16-46). It would have been obvious to one skilled in the art at the time the invention was made to select a ceramic membrane for filtration of beer at pH within the ranges disclosed in Strohm et al ('592), or modify the pH at a convenient pH, since Galaj teaches that the performance of ceramic membranes depend not only on pore size but also on chemical and physico-chemical interactions between the surfaces of the pores and the fluids to be filtered, and that it is essential to match the nature of the surface with the fluid under consideration *column 1, lines 57-63). It would have been there obvious to experiment optimum membrane performance, for membranes having materials suggested by Galaj, e.g. by changing chemical properties of the fluid to be filtered, when selecting different chemical conditions, e.g. pH.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana Fortuna whose telephone number is (703) 308-3857. The examiner can normally be reached on Monday-Friday from 9:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda Walker, can be reached on (703) 308-0457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.



Ana Fortuna

October 20, 2003